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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/933,743	08/22/2001	Jorn Tinnemeyer	C598 0001	6515

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EXAMINER	
BELL, MELTIN	

ART UNIT	PAPER NUMBER
2129	

DATE MAILED: 07/15/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/933,743	TINNEMEYER, JORN	
	Examiner	Art Unit	
	Meltin Bell	2121	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *22 April 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-35 and 37-40* is/are pending in the application.

4a) Of the above claim(s) *36* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-35 and 37-40* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *22 April 2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *20050422*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

This action is responsive to application **09/933,743** filed **08/22/2001** as well as the Preliminary Amendment filed 10/16/03 and the Specification Changes, Drawing Corrections and Amendment filed 4/22/05. Claims 1-35 and 37-40 filed by the applicant have been entered and examined. Claim 36 has been canceled. An action on the merits of claims 1-35 and 37-40 appears below.

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 1, 24 and 37 stand rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. The language of the claims (e.g. "training", "parameter", "value", etc.) raise a question as to whether the claims are directed merely to an abstract idea that is not tied to a technological art, environment or machine which would result in a practical application producing a concrete, useful, and tangible result to form the basis of statutory subject matter under 35 U.S.C. 101. For example, if claim 1 was amended to require performance of a result outside of a computer, such as on a monitor, it will be statutory in most cases since use of technology permits the function of the descriptive material to be realized.

Claim Rejections - 35 USC § 103

To expedite a complete examination of the instant application, the claims rejected under 35 U.S.C. 101 (nonstatutory) above are further rejected as set forth below in anticipation of applicant amending these claims to place them within the four statutory categories of invention.

Applicant's arguments have been fully considered, but are moot in view of new grounds of rejection. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-2 and 37 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Singh et al* United States Patent Number (USPN) 6,456,988 "Method for determining state-of-health using an intelligent system" (Filed March 9, 1998) in view of *Jones et al* USPN 6,526,361 "Battery testing and classification" (371 c1, 2, 4 Date July 5, 2000) in view of *Rine et al* "A reusable software adaptive fuzzy controller architecture" (February 1996) and in further view of *Sun et al* USPN 5,664,066 "Intelligent system for automatic feature detection and selection or identification" (Sep. 2, 1997).

Regarding claim 1:

Singh et al teaches a computer-implemented method for training a fuzzy logic inference system to produce an output indicative of a characteristic of a system in response to a plurality of parameter values of the system, the method comprising: a) providing a set of fuzzy logic membership functions, the set comprising a plurality of membership functions corresponding to each of the input (column 4, lines 1-40) parameters (Abstract), b) obtaining parameter values from a system (Fig. 1, items 14a-b) for which the characteristic has a known value (Fig. 3, items 20-21), c) for each of the parameter values obtained from the system obtaining a system-specific set of fuzzy logic membership functions by scaling (column 4, lines 29-30) the corresponding plurality of membership functions and d) using the system-specific set of membership functions to obtain outputs (column 4, lines 41-67) indicative of the characteristic of test systems.

However, *Singh et al* doesn't explicitly teach the system is a calibration system, a set of fuzzy logic membership functions is a prototype set of fuzzy logic membership functions and c) for each of the parameter values obtained from the system obtaining a system-specific set of fuzzy logic membership functions by scaling the corresponding plurality of membership functions relative to parameter value axes of the membership functions while *Jones et al* teaches the system is a calibration system (column 1, lines 45-53) and obtaining parameter values from a calibration system for which the characteristic has a known value (column 4, lines 9-12), *Rine et al* teaches a set of fuzzy logic membership functions is a prototype (page 635, left column, paragraph 2) set of fuzzy logic

membership functions (page 635, left column, paragraph 3) and *Sun et al* teaches c) for each of the parameter values obtained from the system obtaining a system-specific set of fuzzy logic membership functions by scaling the corresponding plurality of membership functions relative to parameter value axes of the membership functions (column 18, lines 37-48).

Motivation - The portions of the claimed method would have been a highly desirable feature in this art for producing a battery model having smaller variance (*Jones et al*, column 1, lines 53-58), automatically training the membership functions (*Rine et al*, page 634, right column, paragraph 3) and incorporating already-known abstract information about the nature of the input data (*Sun et al*, column 8, lines 44-48). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made, to modify *Singh et al* as taught by *Jones et al, Rine et al* and *Sun et al* for the purpose of producing a battery model having smaller variance as well as automatically training the membership functions and incorporating already-known abstract information about the nature of the input data.

Regarding claim 2:

The rejection of claim 2 is the same as that for claim 1 as recited above since the stated limitations of the claim are set forth in the references. Claim 2's limitation is taught in *Singh et al*: the system comprises an electrochemical battery and the characteristic comprises a state of health of the battery (Abstract).

Regarding claim 37:

Singh et al teaches a computer-implemented method for training a characteristic measuring system to produce an output indicative of a characteristic of a 'test system in response to a plurality of parameter values of the test system, the method comprising: providing a set of functions (column 4, lines 1-40), the set comprising a plurality of functions, each one of the functions corresponding to a corresponding one of the parameters (Abstract), obtaining parameter values from a system (Fig. 1, items 14a-b) for which the characteristic has a known value (Fig. 3, items 20-21), for each of the parameter values obtained from the calibration system, obtaining a system-specific set of functions by scaling (column 4, lines 29-30) the corresponding plurality of functions and using the system-specific set of functions to obtain one or more outputs (column 4, lines 41-67) indicative of the characteristic of a test system.

However, *Singh et al* doesn't explicitly teach calibration, the set of functions is a prototype set of functions and for each of the parameter values obtained from the calibration system, obtaining a system-specific set of functions by scaling the corresponding plurality of functions relative to parameter value axes of the membership functions while *Jones et al* teaches the system is a calibration system (column 1, lines 45-53) and obtaining parameter values from a calibration system for which the characteristic has a known value (column 4, lines 9-12), *Rine et al* teaches the set of functions is a prototype (page 635, left column, paragraph 2) set of functions (page 635, left column, paragraph 3) and *Sun et al* teaches for each of the parameter values

obtained from the calibration system, obtaining a system-specific set of functions by scaling the corresponding plurality of functions relative to parameter value axes of the membership functions (column 18, lines 37-48).

Motivation - The portions of the claimed method would have been a highly desirable feature in this art for producing a battery model having smaller variance (*Jones et al*, column 1, lines 53-58), automatically training the membership functions (*Rine et al*, page 634, right column, paragraph 3) and incorporating already-known abstract information about the nature of the input data (*Sun et al*, column 8, lines 44-48). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made, to modify *Singh et al* as taught by *Jones et al, Rine et al* and *Sun et al* for the purpose of producing a battery model having smaller variance as well as automatically training the membership functions and incorporating already-known abstract information about the nature of the input data.

Claims 4-5 and 38 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Singh et al* in view of *Jones et al* in view of *Rine et al* and in further view of *Shi et al* "A learning algorithm for tuning fuzzy inference rules" (22-25 Aug. 1999).

in view of Sun et al

Regarding claim 4:

Singh et al teaches a computer-implemented method for training a fuzzy logic inference system to produce an output indicative of a characteristic of a system in response to a plurality of parameter values of the system, the method comprising: a) providing a set of

fuzzy logic membership functions, the set comprising a plurality of membership functions corresponding to each of the input (column 4, lines 1-40) parameters (Abstract), b) obtaining parameter values from a system (Fig. 1, items 14a-b) for which the characteristic has a known value (Fig. 3, items 20-21), c) for each of the parameter values obtained from the system obtaining a system-specific set of fuzzy logic membership functions by scaling (column 4, lines 29-30) the corresponding plurality of membership functions and d) using the system-specific set of membership functions to obtain outputs (column 4, lines 41-67) indicative of the characteristic of test systems and the system comprises an electrochemical battery and the characteristic comprises a state of health of the battery (Abstract).

However, *Singh et al* doesn't explicitly teach the system is a calibration system, a set of fuzzy logic membership functions is a prototype set of fuzzy logic membership functions, c) for each of the parameter values obtained from the system obtaining a system-specific set of fuzzy logic membership functions by scaling the corresponding plurality of membership functions relative to parameter value axes of the membership functions and triangular membership functions completely specifiable by three numbers while *Jones et al* teaches the system is a calibration system (column 1, lines 45-53) and obtaining parameter values from a calibration system for which the characteristic has a known value (column 4, lines 9-12), *Rine et al* teaches a set of fuzzy logic membership functions is a prototype (page 635, left column, paragraph 2) set of fuzzy logic membership functions (page 635, left column, paragraph 3), *Sun et al* teaches c) for

each of the parameter values obtained from the system obtaining a system-specific set of fuzzy logic membership functions by scaling the corresponding plurality of membership functions relative to parameter value axes of the membership functions (column 18, lines 37-48) and *Shi et al* teaches the fuzzy logic membership functions are triangular membership functions completely specifiable by three numbers (page I-378, section 2.1, paragraph 2).

Motivation - The portions of the claimed method would have been a highly desirable feature in this art for producing a battery model having smaller variance (*Jones et al*, column 1, lines 53-58), automatically training the membership functions (*Rine et al*, page 634, right column, paragraph 3), incorporating already-known abstract information about the nature of the input data (*Sun et al*, column 8, lines 44-48) and obtaining optimal fuzzy inference rules (*Shi et al*, Abstract). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made, to modify *Singh et al* as taught by *Jones et al, Rine et al, Sun et al* and *Shi et al* for the purpose of producing a battery model having smaller variance as well as automatically training the membership functions, incorporating already-known abstract information about the nature of the input data and obtaining optimal fuzzy inference rules.

Regarding claim 5:

The rejection of claim 5 is the same as that for claim 4 as recited above since the stated limitations of the claim are set forth in the references. Claims 5's limitation is taught in

Shi et al: each of the membership functions is specified by a left intercept point, a mid-point and a right intercept point (page I-378, section 2.1, paragraph 2).

Regarding claim 38:

Singh et al teaches a computer-implemented method for training a characteristic measuring system to produce an output indicative of a characteristic of a 'test system in response to a plurality of parameter values of the test system, the method comprising: providing a set of functions (column 4, lines 1-40), the set comprising a plurality of functions, each one of the functions corresponding to a corresponding one of the parameters (Abstract), obtaining parameter values from a system (Fig. 1, items 14a-b) for which the characteristic has a known value (Fig. 3, items 20-21), for each of the parameter values obtained from the calibration system, obtaining a system-specific set of functions by scaling (column 4, lines 29-30) the corresponding plurality of functions and using the system-specific set of functions to obtain one or more outputs (column 4, lines 41-67) indicative of the characteristic of a test system.

However, *Singh et al* doesn't explicitly teach calibration, the set of functions is a prototype set of functions, for each of the parameter values obtained from the calibration system, obtaining a system-specific set of functions by scaling the corresponding plurality of functions relative to parameter value axes of the membership functions and the functions are triangular while *Jones et al* teaches the system is a calibration system (column 1, lines 45-53) and obtaining parameter values from a calibration system for which the characteristic has a known value (column 4, lines 9-12),

Rine et al teaches the set of functions is a prototype (page 635, left column, paragraph 2) set of functions (page 635, left column, paragraph 3), *Sun et al* teaches for each of the parameter values obtained from the calibration system, obtaining a system-specific set of functions by scaling the corresponding plurality of functions relative to parameter value axes of the membership functions (column 18, lines 37-48) and *Shi et al* teaches the functions are triangular (page I-378, section 2.1, paragraph 2).

Motivation - The portions of the claimed method would have been a highly desirable feature in this art for producing a battery model having smaller variance (*Jones et al*, column 1, lines 53-58), automatically training the membership functions (*Rine et al*, page 634, right column, paragraph 3), incorporating already-known abstract information about the nature of the input data (*Sun et al*, column 8, lines 44-48) and obtaining optimal fuzzy inference rules (*Shi et al*, Abstract). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made, to modify *Singh et al* as taught by *Jones et al, Rine et al, Sun et al* and *Shi et al* for the purpose of producing a battery model having smaller variance as well as automatically training the membership functions, incorporating already-known abstract information about the nature of the input data and obtaining optimal fuzzy inference rules.

RESPONSE TO APPLICANTS' AMENDMENT REMARKS

Applicant argues that no new subject matter has been added in the amendment to the drawings and the specification for correcting errors (Amendment REMARKS page 21, paragraph 4). Applicant's arguments have been considered and are persuasive. The earlier objections to the specification and drawings are withdrawn.

However, the new issue in the amendments to claims 1 and 37 (i.e. appending 'relative to the parameter value axes...' to step c of claim 1 and the third step of claim 37) are noted for necessitating the above new grounds of rejection. It is also noted that dependent claims 3, 6-35 and 39-40 were not rewritten in independent form correcting objections and/or rejections to independent claims 1, 24 and 37 and including all of the limitations of the base claim and any intervening claims.

Information Disclosure Statement (IDS)

Applicant argues that WO 00/19578 was submitted in an IDS on 5/15/02 and that a copy of the 5/15/02 IDS was enclosed with the amendment (Amendment REMARKS page 21, paragraph 6). In considering the IDS received with the 4/22/05 amendment, the examiner notes that it fails to comply with the provisions of 37 CFR 1.97, 1.98 and MPEP § 609 because of missing or inaccurate information in the listing:

- WO 00/19578 and all three Other Art references are missing.

It has been placed in the application file. Applicant is advised that the date of any re-submission of any item of information contained in this information disclosure statement

or the submission of any missing element(s) will be the date of submission for purposes of determining compliance with the requirements based on the time of filing the statement, including all certification requirements for statements under 37 CFR 1.97(e). See MPEP § 609 ¶ C(1).

Claim Rejections - 35 USC § 101

Applicant argues that claims 1, 24 and 37 relate to patentable subject matter because they recite computer-implemented or automatic methods that require measurements of physical objects or activities to be transformed outside of the computer into computer data (Amendment REMARKS page 20, paragraph 2). Applicant's arguments have been considered, but are not persuasive. The output of each of the claimed inventions is not displayed or otherwise represented as affecting the physical world. Consequently, the rejection of claims 1, 24 and 37 under 35 USC 101 is maintained. Furthermore, dependent claims 2-23, 25-35 and 38-40 are objected to for being dependent on a rejected independent claim.

Claim Rejections - 35 USC § 103

Applicant argues that *Singh et al* USPN 6,456,988, *Jones et al* USPN 6,526,361 and *Rine et al* "A reusable software adaptive fuzzy controller architecture" do not recite that scaling is performed relative to a parameter value axis of a membership function, specification paragraphs [0080] to [0086] (Amendment REMARKS page 21, paragraph

2). Applicant's arguments have been fully considered, but are moot in view of new grounds of rejection.

The examiner agrees that *Sun et al* USPN 5,664,066 column 18, lines 37-48 in combination with *Singh et al, Jones et al, Rine et al* and *Shi et al* "A learning algorithm for tuning fuzzy inference rules" meets each and every limitation of claims 1-2, 4-5 and 37-38 as well as dependent claims 3, 6-23, 30-35 and 39-40: scaling is performed relative to a parameter value axis of a membership function, for example. Further, the purpose and motivation for modifying *Singh et al* as taught by other references include producing a battery model having smaller variance (*Jones et al*, column 1, lines 53-58), automatically training the membership functions (*Rine et al*, page 634, right column, paragraph 3), incorporating already-known abstract information about the nature of the input data (*Sun et al*, column 8, lines 44-48) and obtaining optimal fuzzy inference rules (*Shi et al*, Abstract).

As set forth above with regards to *Singh et al, Jones et al, Rine et al, Sun et al* and *Shi et al*, the items listed explicitly and inherently teach each element of the applicants' claimed limitations. Applicants have not set forth any distinction or offered any dispute between the claims of the subject application, *Singh et al's* Method for determining state-of-health using an intelligent system, *Jones et al's* Battery testing and classification, *Rine et al's* A reusable software adaptive fuzzy controller architecture, *Sun et al's* Intelligent system for automatic feature detection and selection or identification and *Shi et al's* A learning algorithm for tuning fuzzy inference rules.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

The following prior art made of record is considered pertinent to applicant's disclosure:

- *Pakonen et al;* US 6445189 B1; Method and system for identifying cause of partial discharges

- *Benson et al;* US 6898585 B2; Fuzzy logic method for adaptively evaluating the validity of sensor data

- *Gartstein et al*; US 6835491 B2; Battery having a built-in controller

- *Jou et al*; An adaptive fuzzy logic controller: its VLSI architecture and applications; IEEE Transactions on Very Large Scale Integration Systems; Vol. 8, Is. 1; Feb. 2000; pp 52-60

- *Emami et al*; Development of a systematic methodology of fuzzy logic modeling; IEEE Transactions on Fuzzy Systems; Vol. 6, Is. 3; Aug. 1998; pp 346-361

- *Gurries*; Smart Battery Charger is Programmed via the SMBus; Linear Technology Magazine;www.linear.com/pc/downloadDocument.do?navId=H0,C1,C1003,C1037,C1078,C1089,P1762,D4852; November 1999; pp 6-10, 18

Any inquiry concerning this communication or earlier communications from the Office should be directed to Meltin Bell whose telephone number is 571-272-3680. This Examiner can normally be reached on Mon - Fri 7:30 am - 4:00 pm.

If attempts to reach this Examiner by telephone are unsuccessful, his supervisor, Anthony Knight, can be reached on 571-272-3687. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 571-272-2100.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

MB
July 9, 2005

Anthony Knight
Supervisory Patent Examiner
Group 3600

OK TO ENTER AS APPROVED 7/9/05 M.B.

REPLACEMENT SHEET 09/933743

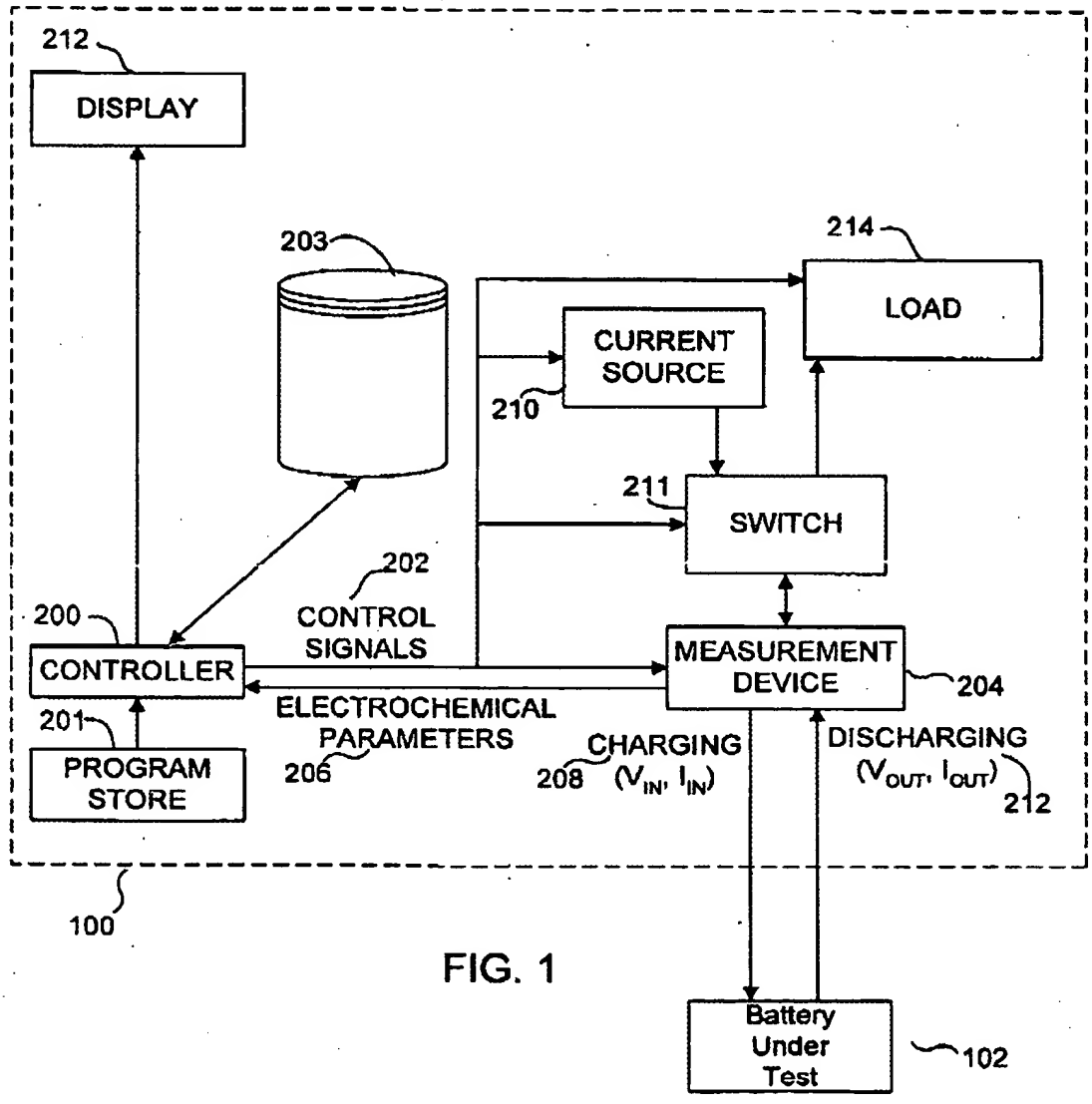

FIG. 1

OK TO ENTER AS APPROVED 7/9/05 QM.B,

REPLACEMENT SHEET 09/933743

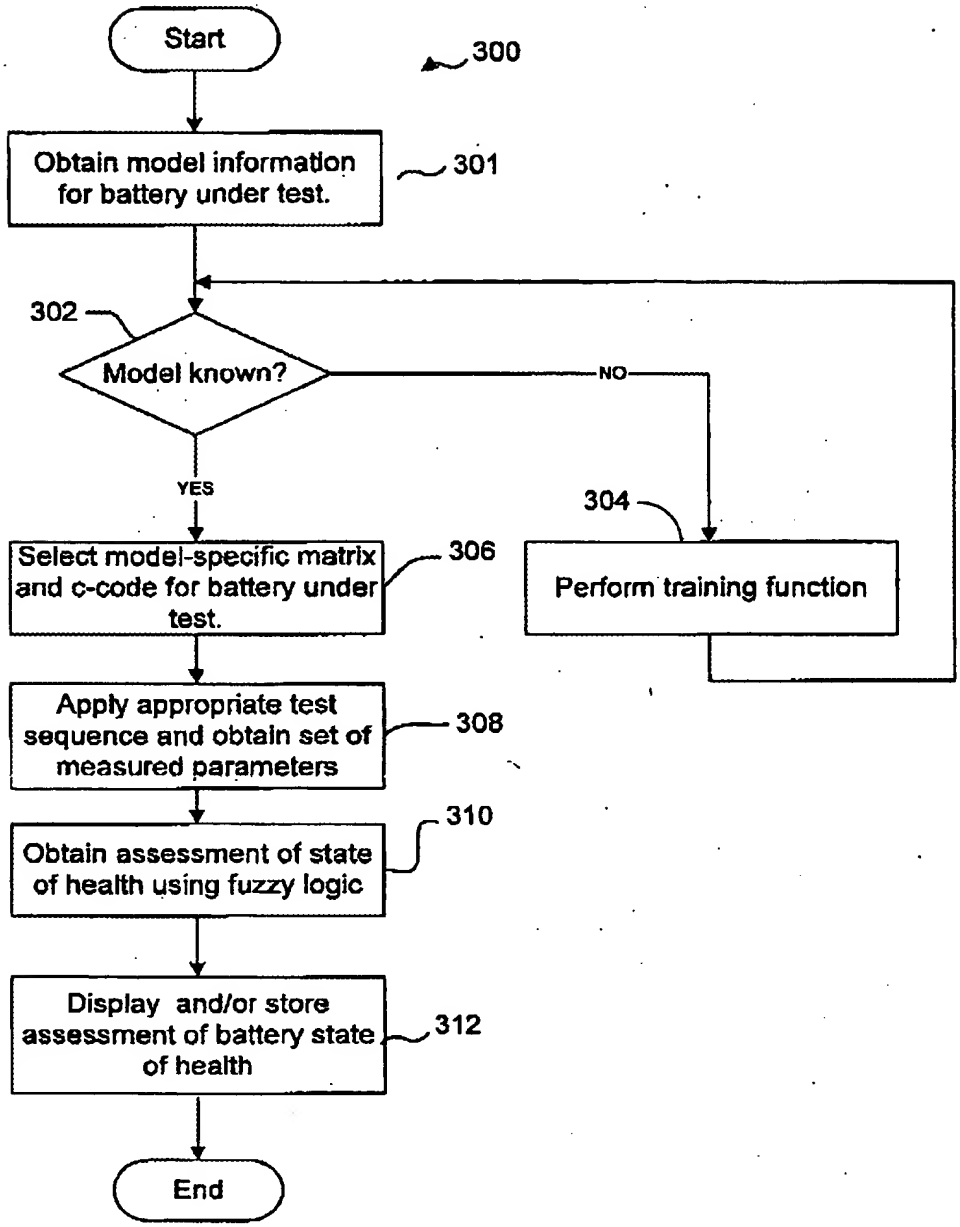

FIG. 3

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REPLACEMENT SHEET 09/933743

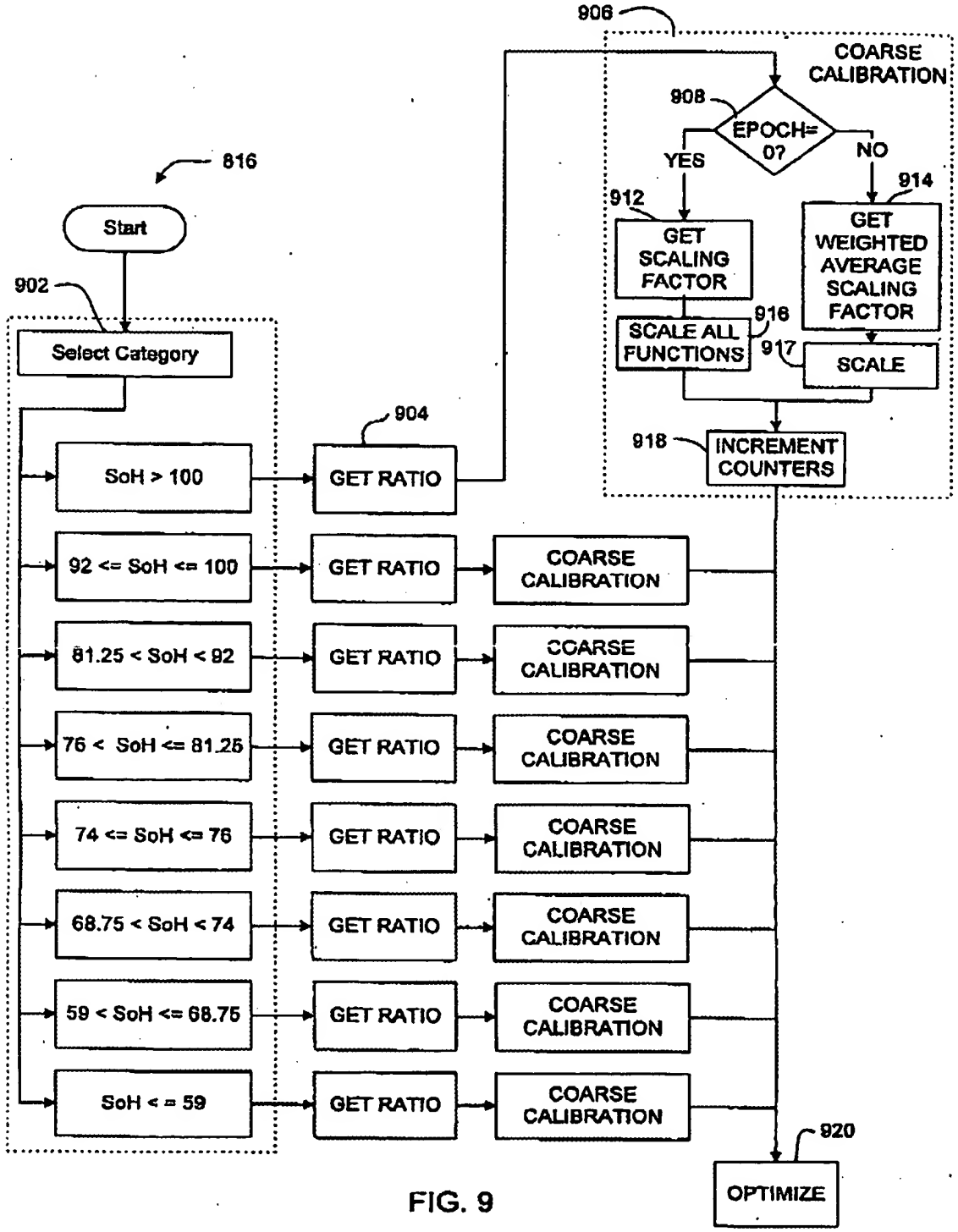

FIG. 9

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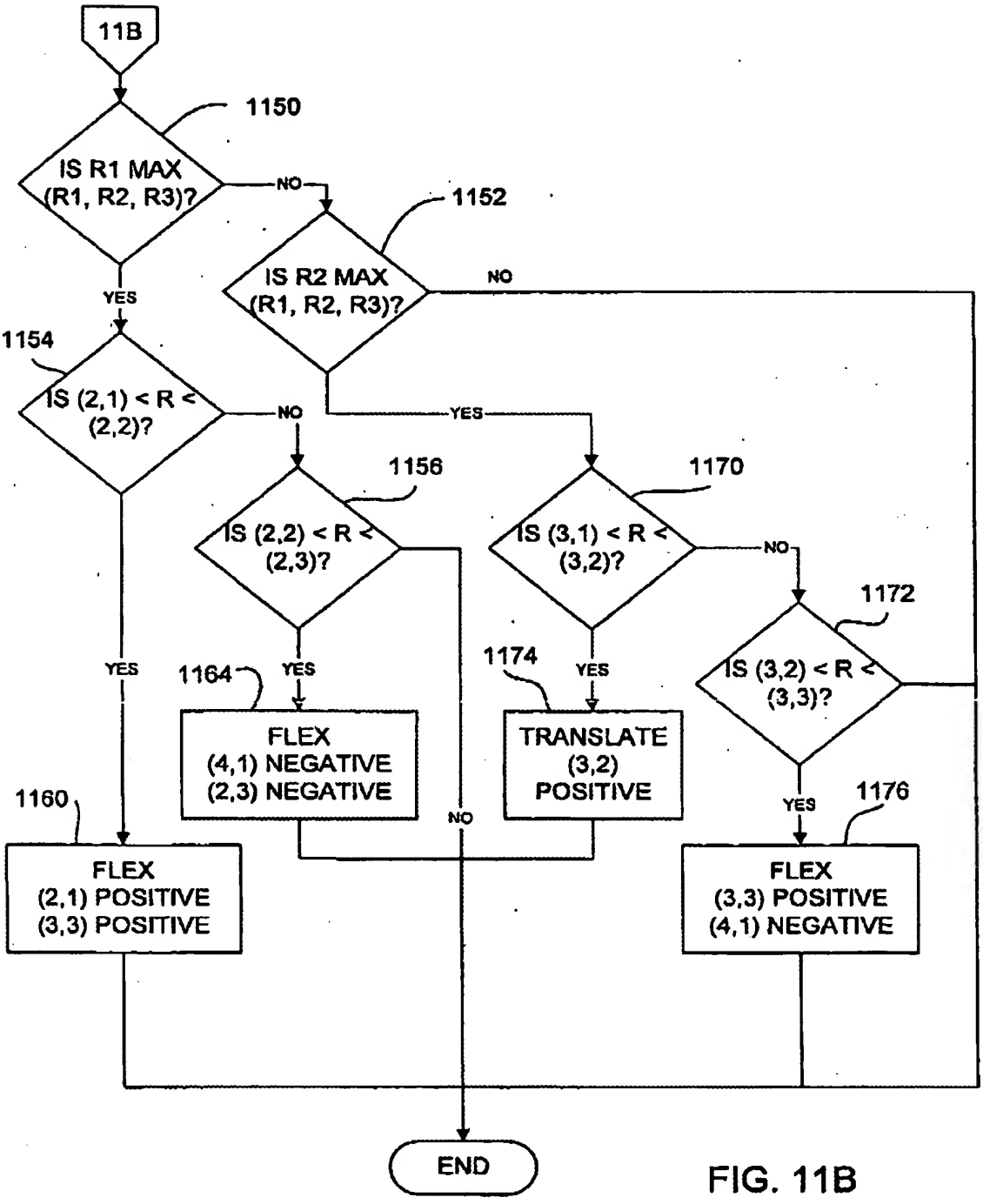

FIG. 11B

OK TO ENTER AS APPROVED 7/9/05 M.N.

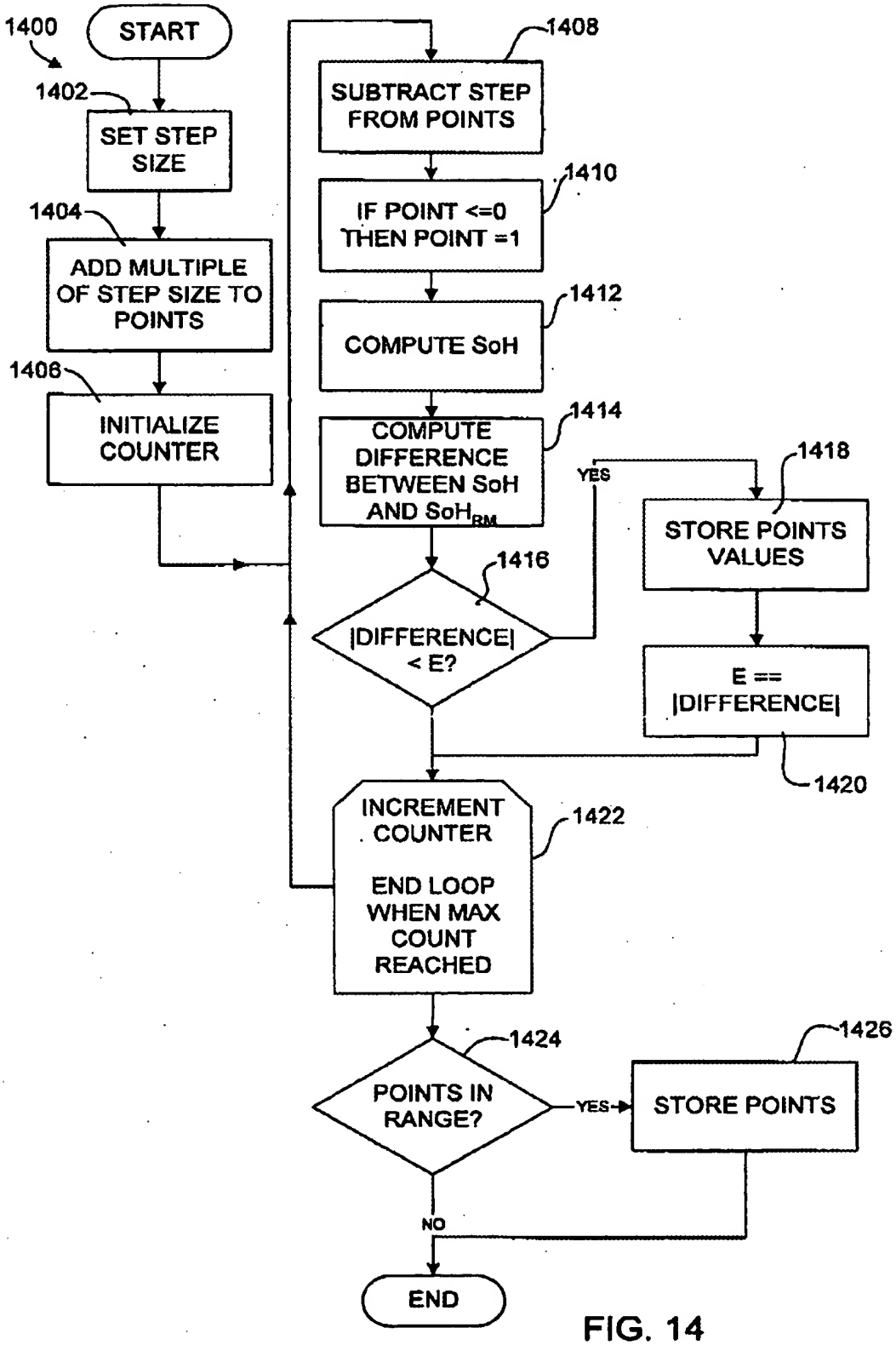

FIG. 14

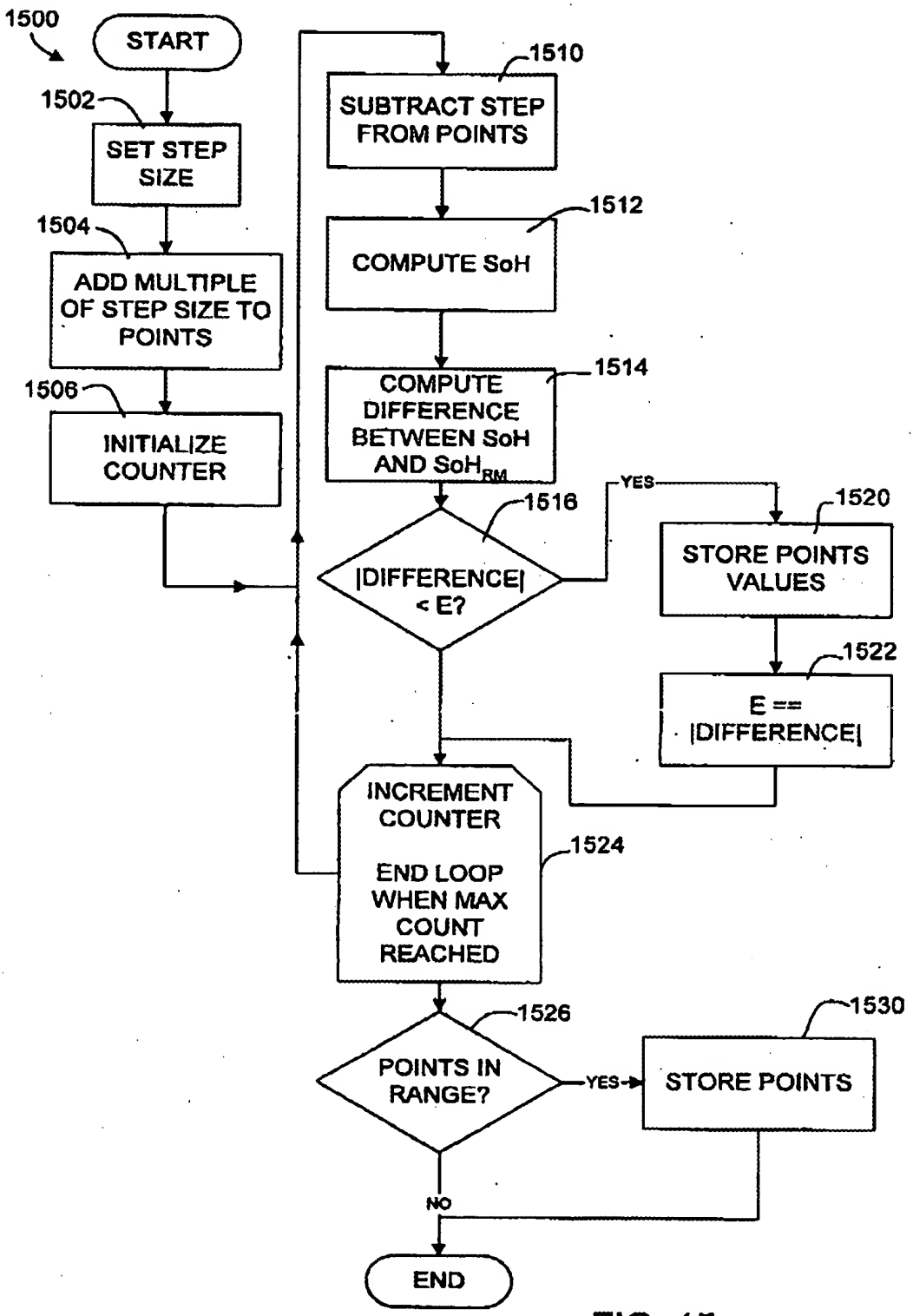

FIG. 15